

EFFECTS OF ROOT-KNOT NEMATODES ON ORNAMENTAL PLANTS

D. E. Stokes

Root-knot nematodes (Meloidogyne spp.) are more widely distributed throughout the world than any other major group of plant parasitic nematodes. They probably do more damage to ornamental plants than any other single genus of nematodes. Members of this genus occur throughout Florida and are often responsible for damage to ornamentals.

After prolonged exposure to root-knot nematode infection, plants usually become stunted, are often chlorotic, and may be generally unthrifty. A loss of plant vigor results in crop production losses and reduced returns to the grower.

Root systems and sometimes other plant parts, such as stems or leaves may suffer damage by Meloidogyne, which normally consists of galled and deformed tissues.

Effects of Root-Knot Nematodes to the Plant

Second-stage larvae initiate infection as they penetrate epidermal cells, feed, and migrate into cortical and vascular tissue where they become sedentary parasites. As a result, plant cells on which the root-knot nematodes feed become abnormally enlarged and results in the formation of giant cells (fig. 1). These cells serve as the food reservoir for the nematodes as they grow and become sexually mature. Galls are produced on roots of infected plants by cell stimulation and proliferation due to the feeding of root-knot nematodes. Although galls are usually prominent on many plants infected by root-knot nematodes (fig. 2), some plants such as grasses develop little, if any, gall formation.

Egg to egg generation may occur in 25-30 days under favorable conditions, which usually accounts for high numbers of secondary infections by the numerous successive generations. When the nematode is feeding on preferred hosts, the reproduction cycle usually continues until limited by lack of food.

Plant damage may vary from slight infection of part of a single plant to severe damage and crop loss of an entire field of plants. Pre-plant populations of root-knot nematode, suitability of a particular host plant, and the climatic conditions greatly influence the potential damage in a given situation. A single species of root-knot nematode is usually polyphagous, i.e., it feeds on many different host plants, which limits the effectiveness of crop rotation in nematode control.

Control

Complete elimination or eradication of root-knot nematode is not a practical method when attempting to control the pest in large crop fields. A pre-plant nematicide is most often applied to reduce the root-knot nematode level to the point that young plants may become established and begin growth before large populations of the nematodes are established. Materials such as DD, DBCP, EDB, or Telone, used according to manufacturer's recommendations, offer excellent field control of root-knot nematodes.

For plants grown in containers or beds sterilization of the components of such systems offers the most effective control for root-knot nematodes. Soil is generally treated after the various constituents are blended within beds or into mounds. Pots or benches should be disinfested prior to being filled with the soil mix. Seeds or vegetative plant parts can be produced free of nematodes by growing them in previously sterilized soil. Seeds are not likely to be infected by root-knot nematodes, but should be checked for possible contamination. Bedding or potting mixes are often heat-treated or chemically-treated with methyl bromide. Pots should be thoroughly scrubbed and disinfested with a 5% solution of sodium hypochlorite or 4% formalin and allowed to dry several days prior to use. Use and rates of chemicals should be determined by specific case and not by generality.

Care should be taken to minimize the contamination of other non-infested plants in any culturing of ornamental plants.



Fig. 1 Sedentary root-knot nematode female (arrow) feeding on giant cells (A).

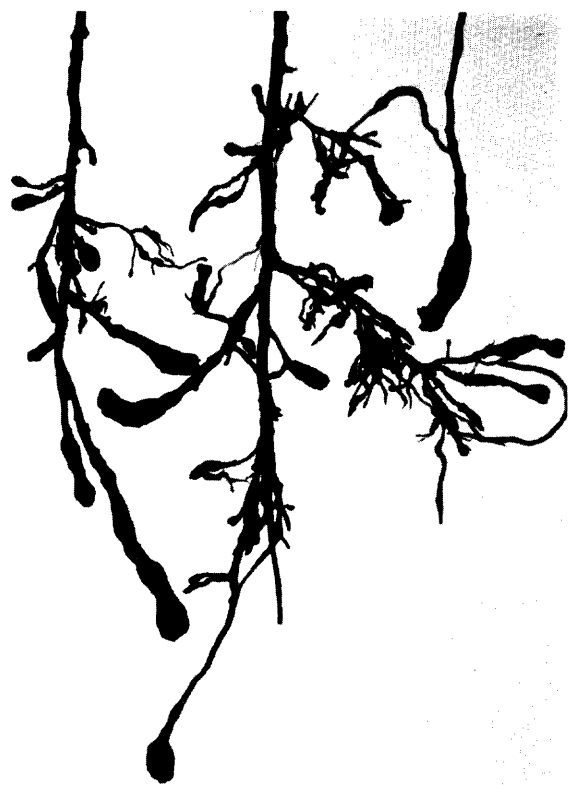


Fig. 2 Galled roots of plant infested by root-knot nematodes.

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